

Claims

What is claimed is:

5 1. A digital signaling system comprising:

a transmit circuit, the transmit circuit comprising a transmit data input and a transmit data output, the transmit circuit producing an transmit data output signal at the transmit data output based on a transmit data input signal from the transmit data input when the transmit circuit is operating in a normal mode, the transmit circuit further
10 comprising a transmit repeating pattern generator producing a repeating pattern signal, the transmit circuit producing the transmit data output signal at the transmit data output based on the repeating pattern signal when the transmit circuit is operating in a test mode;
and

a receive circuit, the receive circuit operably coupled to the transmit circuit and
15 receiving the transmit data output signal from the transmit circuit at a receive data input, the receive circuit comprising a receive data output, the receive circuit producing a receive data output signal at the receive data output based on transmit data output signal when the receive circuit is operating in the normal mode, the receive circuit further comprising a receive repeating pattern generator producing the repeating pattern signal,
20 the receive circuit producing a comparison signal based on comparison dependent on the transmit-data-output signal and the repeating pattern signal when the receive circuit is operating in the test mode.

2. The digital signaling system of claim 1 wherein the transmit repeating pattern
25 generator comprises a transmit shift register and the receive repeating pattern generator comprises a receive shift register.

3. The digital signaling system of claim 2 wherein a transmit shift register output of the transmit shift register is coupled a transmit shift register input of the transmit shift
30 register when the transmit circuit is operating in the test mode and a receive shift register

output of the receive shift register is coupled to a receive shift register input of the receive shift register when the receive circuit is operating in the test mode.

4. The digital signaling system of claim 2 wherein the transmit circuit further
5 comprises a transmit linear feedback logic gate, wherein a first transmit shift register
output of the transmit shift register is coupled a first transmit linear feedback logic input
of the transmit linear feedback logic gate and wherein a second transmit shift register
output of the transmit shift register is coupled a second transmit linear feedback logic
input of the transmit linear feedback logic gate, the transmit linear feedback logic gate
10 producing a transmit linear feedback logic gate output signal upon which a transmit shift
register input signal at a transmit shift register input of the transmit shift register depends
when the transmit circuit is operating in the test mode and wherein the receive circuit
further comprises a receive linear feedback logic gate, wherein a first receive shift
register output of the receive shift register is coupled to a first receive linear feedback
15 logic input of the receive linear feedback logic gate and wherein a second receive linear
feedback logic input of the receive linear feedback logic gate, the receive linear feedback
logic gate producing a receive linear feedback logic gate output signal upon which a
receive shift register input signal at a receive shift register input of the receive shift
register depends when the receive circuit is operating in the test mode.

20 5. The digital signaling system of claim 1 wherein the transmit repeating pattern
generator comprises a transmit linear feedback shift register and the receive repeating
pattern generator comprises a receive linear feedback shift register.

25 6. The digital signaling system of claim 1 wherein the transmit data output signal is
capable of representing two bits of information simultaneously over a single conductor.

7. The digital signaling system of claim 1 wherein the transmit data output signal is
communicated over a single conductor referenced to a ground voltage.

8. The digital signaling system of claim 1 wherein the transmit data output signal is communicated as a differential signal over two conductors.

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9. A method for evaluating a digital signaling system comprising the steps of:
generating a transmit repeating pattern in a transmit circuit;
transmitting the transmit repeating pattern to a receive circuit;
generating a receive repeating pattern in the receive circuit; and
5 comparing the transmit repeating pattern to the receive repeating pattern to obtain
a comparison.

10. The method of claim 9 further comprising the steps of:
adjusting a parameter affecting operation of the transmit circuit based on the
10 comparison.

11. The method of claim 10 wherein the parameter is selected from a group consisting
of an output current, a crosstalk cancellation coefficient, and a self-equalization
coefficient.

12. The method of claim 9 wherein the step of generating a transmit repeating pattern
in a transmit circuit comprises the step of:
utilizing a shift register to generate the transmit repeating pattern.

13. The method of claim 12 wherein the step of utilizing a shift register to generate
the transmit repeating pattern comprises the step of:
utilizing a linear feedback shift register to generate the transmit repeating pattern.

14. The method of claim 9 wherein the step of transmitting the transmit repeating
25 pattern to the receive circuit further comprises the step of:
transmitting the transmit repeating pattern as a signal referenced to a ground.

15. The method of claim 9 wherein the step of transmitting the transmit repeating
pattern to the receive circuit further comprises the step of:
30 transmitting the transmit repeating pattern as a differential signal over a pair of
conductors.

16. The method of claim 9 wherein the step of transmitting the transmit repeating pattern to the receive circuit further comprises the step of:

transmitting the transmit repeating pattern by encoding two bits of information on
5 a single conductor simultaneously.

17. The method of claim 9 further comprising the step of:
adjusting a receiver characteristic of the receive circuit.

10 18. The method of claim 17 wherein the receiver characteristic is selected from a group consisting of an receive circuit timing signal and a voltage reference.

19. The method of claim 17 further comprising the step of:
determining boundary values of the receiver characteristic within which reliable
15 operation of the system is provided.

20. The method of claim 19 further comprising the steps of:
adjusting a parameter affecting operation of the transmit circuit based on the
boundary values.

20 21. The method of claim 20 wherein the parameter is selected from a group consisting of an output current, a crosstalk cancellation coefficient, and a self-equalization coefficient.